

REMARKS/ARGUMENT

Claims 1-31 are pending in the present application. Claims 1, 11, 17, 21, 26, and 29 are independent claims. Claims 6, 21, 23, 24, 26, and 29 have been amended herein.

Claim Objection

The Examiner has objected to terms in claim 5 which lack antecedent basis. Applicants believe the Examiner means to refer to claim 6 which contains the incorrect references to the term “access router” (claim 5 does not include this term). As suggested by the Examiner, the term should refer to “access node” and has been corrected above. Applicants wish to thank the Examiner for noting this mistake.

Claim Rejections – Section 102

The Examiner has rejected independent claims 21, 26, and 29 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,119,005 to Smolik (herein the “Smolik patent”). Applicants respectfully traverse.

The Smolik patent discloses a system for updating handoff “neighbor lists” in a cellular communication system. There are a wide variety of such systems, but the Smolik patent focuses on utilizing pilot strength measurements taken at a mobile subscriber unit and providing the measurements back to a base station serving the existing call connection. These measurements are used by the base station to essentially rank possible handoff base stations in a “neighbor list”. The list represents possible base stations to which the call connection can be transferred in a traditional cellular “handoff.”

The present invention is **not** directed to such traditional techniques for cellular base station handoff.

First, the “access nodes” in the present claim do not refer to base stations, but rather to nodes which provide access to a packet communication network such as the Internet. This is illustrated, for example, by FIG. 1, which depicts a single access node (e.g., “AR1”) serving multiple base stations. As a mobile terminal moves from base station 121 to base station 122,

this results in a traditional handoff; this does not result in a handoff of access node until the mobile terminal moves to the vicinity of base station 123 served by access node "AR2".

Second, the Smolik patent does not disclose "updating a candidate access node list . . . to reflect candidate access nodes discovered by the mobile terminal". The Smolik patent deals with cellular systems with a predefined layout of base stations and carefully engineered cells. The mobile stations in the Smolik patent do not "discover" new candidate access nodes. The present invention, on the other hand, can be used with ad hoc networks where access nodes are added and removed from the network arbitrarily, e.g., such as the wireless local area networks which have become more pervasive over the last several years. The secure discovery of new candidate access nodes is accomplished through the techniques disclosed in the present invention.

The language in claims 21, 26, and 29 has been amended to further clarify that the claim term "access node" as used therein does not refer to traditional base stations but, instead, refers to nodes which provide access to a packet communication network. The Smolik patent is not directed to such structures and techniques. The "neighbor list" in the Smolik patent does not anticipate or read on the "candidate access node list" referenced in the pending claims. Nor does the Smolik patent disclose updating a candidate access node list with candidate access nodes "discovered by the mobile terminal".

Claim Rejections – Section 103

Claims 22-25, 27, and 30-31: Claims 22-25, 27, and 30-31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Smolik patent in view of various additional references. Applicants respectfully traverse. As discussed above, the Smolik patent does not disclose and is not related to "discovery" of "access nodes" as understood in the context of the current invention.

With regard to claims 22, 27 and 30, the claims recite the limitation of wherein the "candidate access node list is represented as a bitmap whose bits correspond to entries in a candidate access node table stored in the access node." The Examiner concedes that the Smolik patent does not disclose this feature, but then makes reference to a passage in the summary of invention of U.S. Patent No. 6,600,917 to Maupin (the "Maupin patent"). The Maupin patent notably merely states that a "base station broadcasts (e.g., in a BCCH message) a capabilities message which includes a supported service bitmap that is decoded by all user equipment units."

Maupin patent, col. 2, lines 64-67. As made clear from the patent, accordingly, the bitmap represents “supported services” where each bit indicates a “radio access technology type”. The Maupin patent does not disclose a “candidate access node list” represented as a “bitmap” where each bit corresponds to an entry in the candidate access node table.

With regard to claims 25 and 31, the Examiner argues to combine the Smolik patent with U.S. Patent No. 6,487,406 to Chang et al. (the “Chang patent”). Although the Chang patent is, similar to the present invention, directed to the issues of interfacing IP data networks with traditional wireless networks, the Chang patent does not disclose the handoff candidate discovery techniques which are the subject matter of the present invention. And the Smolik patent, when combined with the Chang patent, still does not result in the present invention. The Smolik patent, as discussed above, is directed to traditional cellular handoff with automating ranking of neighbor lists base generated at the base stations based on signal measurements. The Smolik patent would merely address the interactions between the base stations and the mobile terminals without addressing the discovery and handoff of the elements in the Chang patent which interact with the IP network.

With regard to claim 23, the Examiner concedes that the Smolik patent does not disclose digitally signing a “candidate access node list” prior to providing the list to a mobile terminal; nor does it disclose “establishing a key for secure message exchange” as recited in claim 24. The Examiner then cites to U.S. Patent No. 6,813,357 to Matsuzaki et al. (the “Matsuzaki patent”) as showing that a base station can digitally sign secret information in general before transmission to a mobile station and to U.S. Patent No. 6,370,380 to Norefors et al. (the “Norefors patent”) as disclosing how to protect communications between a mobile station and a base station. The difficulty with this proposition is, similarly to the Smolik patent, the present invention is not directed to base station-to-mobile terminal communication link technologies. Claim 23 has been amended to make it clear that the digital signing occurs at an access node and claim 24 has been amended to make it clear that the secure message exchange is between a mobile station and an access node. Accordingly, the communication of the candidate access node list is protected from tampering even from tampering at the individual base stations. Both the Matsuzaki patent and the Norefors patent are directed to protecting against tampering between the base station and a mobile station. The Norefors patent refers to the base station as an “access point”, but it is clear

from a close reading of the specification that “access point” is merely used as another term for base station (see, e.g., col. 1, line17-18: “fixed radio stations known as base stations or access points”).

Moreover, it should be noted that the Matsuzaki patent merely discloses signing communications in general between a base station and a mobile station and does not disclose anything related to protecting a specific type of information, namely, candidate access node lists.

Claims 1-9, 11-15, 17-19: The Examiner has rejected claims 1-9, 11-15 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over the Norefors patent in view of U.S. Patent Publication 2002/0176445 to Melpignano (the “Melpignano application”). Applicants respectfully traverse.

The Norefors patent is directed to securing the handoff procedure of a mobile terminal from one base station to another base station. In the Norefors patent, a security token is generated at a first base station and transferred to the second base station both through the mobile station and through a direct connection. The second base station verifies the security token before handoff occurs. This is to ensure that intruders do not hijack or disrupt the communication link. Note that in the pending independent claims, the claims recite that the verification step occurs “after handoff of the mobile terminal to a second access node”. In other words, the verification does not occur before handoff occurs. This is because these verification steps in the present invention are intended to protect the integrity of the discovery procedures for candidate access nodes. Accordingly, the “candidate access node” information is not updated until verification occurs. The Norefors patent, on the other hand, is not concerned with candidate access node discovery.

As with the Smolik patent, the Norefors patent is again specifically directed to base station-to-mobile station communications and is directed to traditional cellular handoff procedures and does not disclose “access nodes” as that term is utilized in the present application.

The Examiner concedes that Norefors does not disclose “updating information on candidate access nodes” but instead makes reference to the Melpignano application. However, the Melpignano application reference cited by the Examiner, paragraph 81, merely discloses


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periodically sending a list of candidate access points to each mobile terminal. It provides no disclosure of "updating" such information" and provides no disclosure of how to secure such information by providing certain verification steps before allowing updates to such information. Moreover, the Examiner provides no motivation for combining the Melpignano application, which cover Bluetooth ad hoc networked devices, with the Norefors reference in a coherent manner.

Claims 10, 16, 20, 28: The Examiner has rejected claims 10, 16, 20, and 28 under 35 U.S.C. § 103(a) as being unpatentable over the Norefors patent in view of the Melpignano application and further in view of the Chang patent. The comments above are all similarly applicable to this combination. Moreover, there is no meaningful motivation provided to combine the references which concern very different network architectures.

Applicants respectfully submit that the pending claims represent patentable subject matter and that the application is in condition for allowance. If the Examiner has any questions, please feel free to contact the undersigned at 609 951-2522. Authorization is hereby given to charge any fees which may be required, except the issue fee, to Deposit Account 14-0627.

Respectfully submitted,
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